

Preface

With many experimental undertakings in particle physics around the corner such as the Large Hadron Collider at CERN, many neutrino experiments under way and in the horizon and aspirations for perhaps an International Linear Collider in the not too distant future, the field of particle physics is poised to take a giant leap into unravelling the unknown world of new particles and forces in the coming decades and build on its success of the past four decades. Combined with the spectacular developments in the field of cosmology which has perhaps already given us the standard model of the universe and begging for new ideas from particle theory for a deeper understanding of observations, promise of major breakthroughs and deep insights have filled the air. Many exciting ideas such as supersymmetry, extra dimensions, grand unification are reaching a stage of maturity waiting to be tested. We may also learn about true nature of the dark constituent of the universe as well as about the happenings at the early moments of the Big Bang embodied in the ideas of inflation. These discoveries may also provide better understanding of the formation of structure and evolution of stars and galaxies.

In order to prepare for this new era, the TASI summer school has always been structured to bring to Ph. D. students in US and abroad the latest ideas and information in a cogent and pedagogical manner so as to build the intellectual base for tackling the new theoretical challenges that will emerge and are already emerging. The 2006 TASI school was charged with bringing the new phenomenological, cosmological and model building frontier to the students and researchers of tomorrow. With this in mind we decided to focus on two main themes: Colliders and Neutrinos at the frontier of Physics and invite experts in the related fields to lecture at the school.

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